The History and Scale of the Solar System

Think About It Date

Page E4 Page #

- What objects make up the solar system?
- Where are they located compared to Earth?

WHAT DO YOU THINK?

Activity 1

Digging Deeper Date

Pages E6-11 Page #

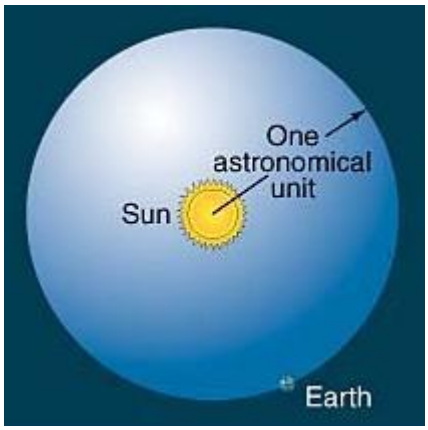
Learning Objective: **Through speaking and writing, SWBAT compare and contrast astronomical unit, light year and parsec, using academic language.**

http://www.brainp-+op.com/science/space/solarsystem/

Astronomical unit the average distance between the sun and Earth

One AU is about 150 million km (93 million miles)

Used to measure distances inside our solar system



Light-year the distance light travels in one year

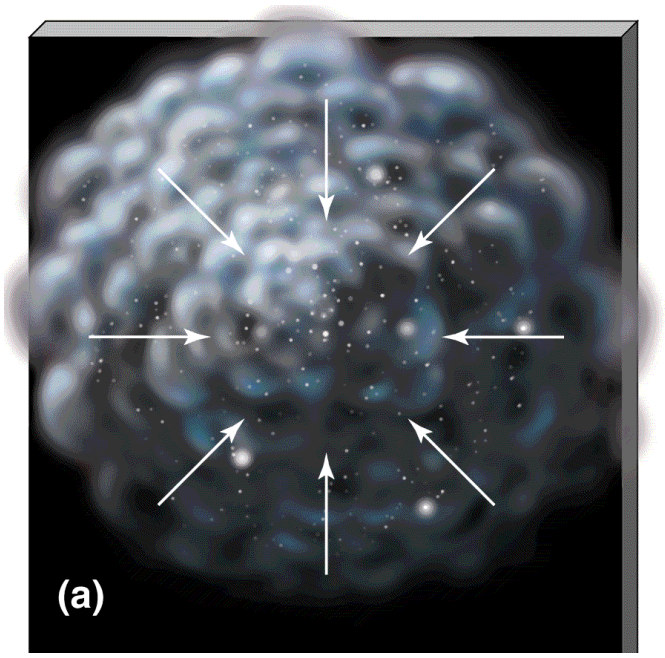
	One light year = 9.5 trillion km Light travels at a speed of 300,000 km/s Used to measure distances inside our galaxy
Parsec	a unit used in astronomy to describe very large distances One parsec = 3.26 light years Used to measure distances between galaxies

http://www.classzone.com/books/earth_science/terc/content/visualizations/es2701/es2701page01.cfm?chapter_no=visualization

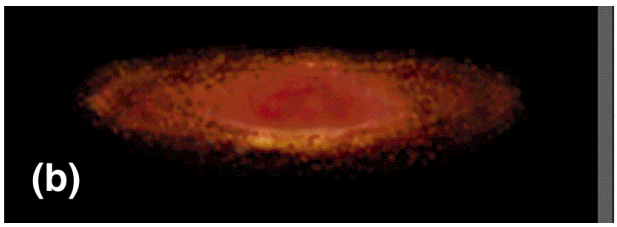
Learning Objective:	**Through speaking and writing, SWBAT explain the nebular theory for the formation of the solar system using academic language.**
Sun	contains over 99% of all of the mass of the solar system
Nebula	a large cloud of gas and dust

Our solar system formed from a nebula

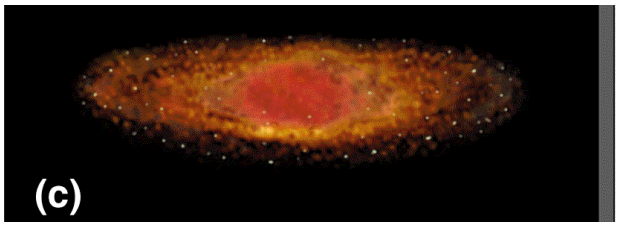
Nebular theory	the idea that the sun and planets began to form from a nebula over 4.5 billion years ago
Birth of solar system	1. More than 4.5 billion years ago, the solar system was a cloud of ice, gas and dust



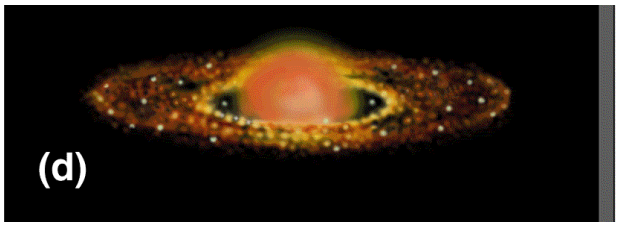
2. Gradually, this cloud contracted into a large, tightly-packed, spinning disk



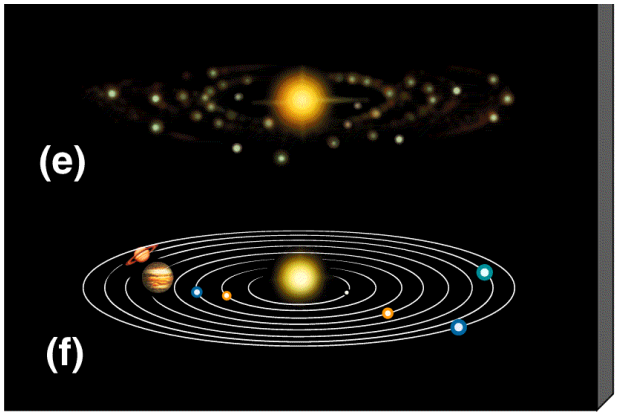
3. The disk's center was so hot and dense that nuclear fusion reactions began to occur, and the sun was born



4. Eventually, the rest of the material in the disk cooled enough for groups of solid clumps to form



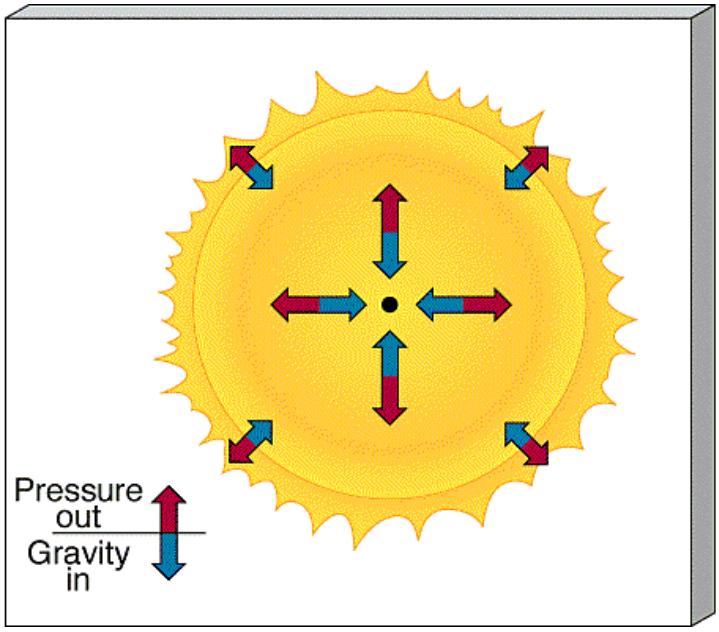
5. Finally, these clumps collided and combined to become the planets that make up the solar system today



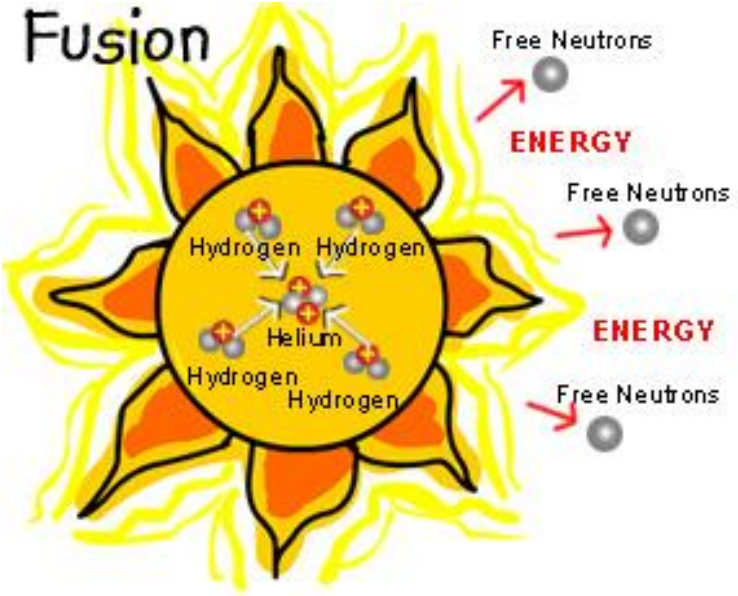
http://www.metacafe.com/watch/1111454/formation_of_the_solar_system_great_animation/

http://www.classzone.com/books/earth_science/terc/content/visualizations/es0401/es0401page01.cfm?chapter_no=visualization

Equilibrium	the force of fusion explosions moving outward from the center of the sun is balanced by the power of gravity pulling in



Nuclear fusion	hydrogen atoms combine with each other to create helium atoms and release energy from the sun



http://www.youtube.com/watch?v=EO9CPO3CBF0

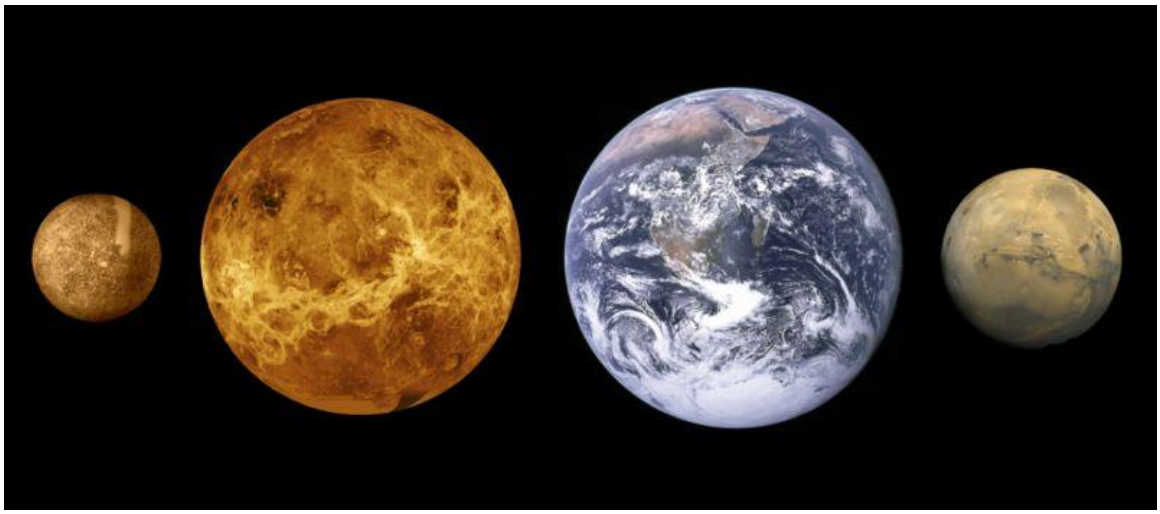
Learning Objective: **Through speaking and writing, SWBAT compare and contrast the characteristics of terrestrial planets and gas giants, using academic language.**

Terrestrial planets

Mercury, Venus, Earth and Mars

They are similar in size, composition and density to Earth

→ small, mostly rocky

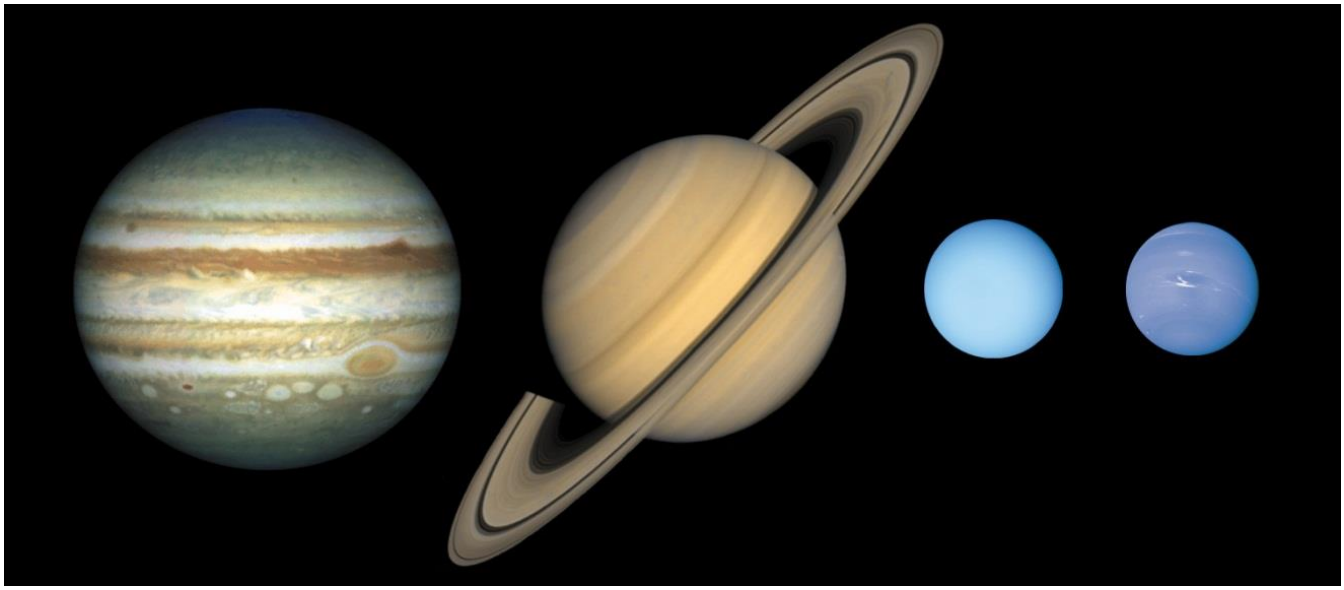


Gas giants

Jupiter, Saturn, Uranus, and Neptune

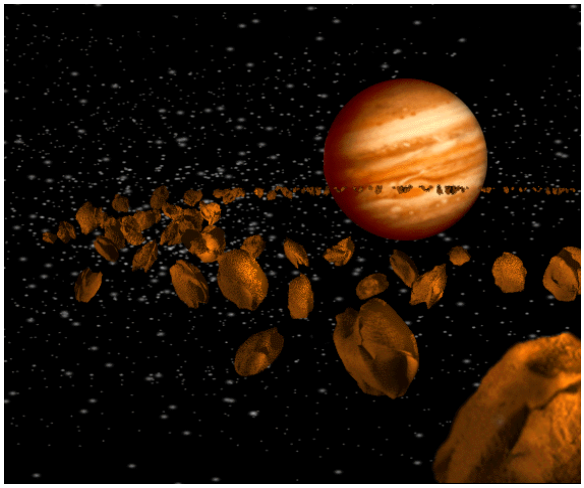
They are made mostly of hydrogen, helium, and methane

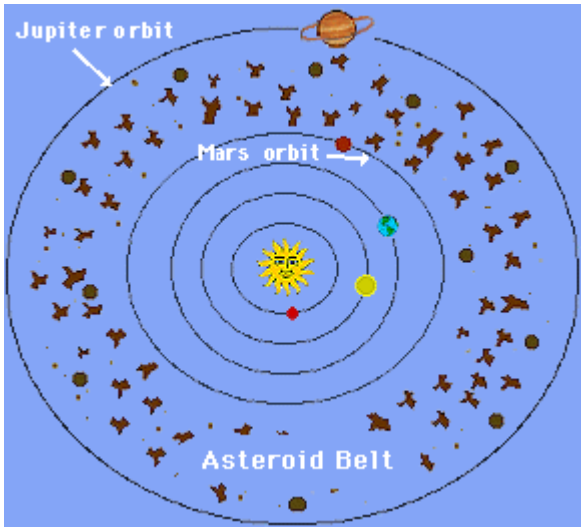
Have solid, rocky cores about the size of Earth



Pluto	the planet farthest from the sun It is a very small body of ice and rock
Learning Objective:	**Through speaking and writing, SWBAT compare and contrast asteroids and comets and predict the effects they have on Earth, using academic language.**
Asteroid	a piece of rock traveling through space that is made of the same material that formed the planets

Asteroid belt — an area between the orbits of Mars and Jupiter with many asteroids





http://www.brainpop.com/science/space/asteroids/

Comet — a chunk of frozen gases, ice, dust and rock particles that orbits the sun

https://www.brainpop.com/science/space/comets/

Crater	a bowl-shaped depression in the ground It forms when comets and asteroids collide with the Earth and objects in the solar system

Learning Objective: **Through speaking and writing, SWBAT define galaxy, and describe the Milky Way galaxy, using academic language.**

Galaxy a large group of stars, gas and dust held together by gravity

Types of galaxies
- spiral
- elliptical
- irregular

http://www.brainpop.com/science/space/galaxies/

Milky Way our galaxy that contains the Earth and its solar system

It formed about 10 billion years ago and is one of billions of galaxies in the universe

http://www.brainpop.com/science/space/milkyway/

Big Bang	the theory that the universe formed about 13.8 billion years ago by expanding suddenly in all directions

http://www.brainpop.com/science/space/bigbang/

http://imgsrc.hubblesite.org/hu/db/2003/27/videos/b/formats/low_quicktime.mov

Activity 1

Check Your Understanding Date

Page E11 Page #

1. What are the distances represented by a light year, an astronomical unit, and a parsec?

2a. Which unit would you use to describe the distance to other stars?

2b. Which units would you use to describe the distance to planets in our solar system?

2c. Which units would you use to describe the distances to other galaxies?

3. Explain the nebular theory for the beginning of our solar system.